LABORATORY DATA CONSULTANTS, INC.
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IWM Consulting Group
7428 Rockville Road
Indianapolis, IN 46214
ATTN: Brad Gentry
bgentry@iwmconsult.com

March 28, 2019

SUBJECT: Former Amphenol Facility, Data Validation

Dear Mr. Gentry,

Enclosed is the final validation report for the fraction listed below. This SDG was received on March 13, 2019. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #44535:

SDG #	**Fraction:**
50218263	Volatiles

The data validation was performed under Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Design-Level Data Soil Investigation Work Plan, Franklin Power Products, Inc./Amphenol Corporation, Franklin, Indiana, February 2019
- Additional Off-site Groundwater Investigation Work Plan, Franklin Power Products, Inc./Amphenol Corporation, Franklin, Indiana, February 2019
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review; January 2017
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
pgeng@lab-data.com
Project Manager/Senior Chemist

Email DVR/cc: cparks@iwmconsult.com

711 pages-EM 1 WEEK TAT Attachment 1

90/10

LDC #44535 (IWM Consulting Group - Indianapolis, IN / Former Amphenol Facility)

LDC	SDG#	DATE REC'D	(3) DATE DUE	(9) VOA (8260C)																															
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	50218263	03/13/19	03/20/19	0	11																														
A	50218263	03/13/19	03/20/19	0	2																														
Total	T/PG			0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13

Shaded cells indicate Level IV validation (all other cells are Level III validation). These counts do not include MS, MSD, Dups.

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LDC Report# 44535A1a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Former Amphenol Facility

LDC Report Date: March 14, 2019

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: Pace Analytical Services, LLC.

Sample Delivery Group (SDG): 50218263

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DSB-45 SL (7.6-8.6)	50218263001	Soil	02/28/19
DSB-45 SL (9.3-10.3)**	50218263002**	Soil	02/28/19
DSB-45 SL (12.5-13.5)	50218263003	Soil	02/28/19
DSB-45 SL (15.5-16.5)	50218263004	Soil	02/28/19
DSB-46 SL (7.6-8.6)	50218263005	Soil	02/28/19
DSB-46 SL (9.3-10.3)	50218263006	Soil	02/28/19
DSB-46 SL (15.5-16.5)	50218263007	Soil	02/28/19
DSB-46 SL (21-22)	50218263008	Soil	02/28/19
DSB-47 SL (7.65-8.65)	50218263009	Soil	02/28/19
DSB-47 SL (9.4-10.4)	50218263010	Soil	02/28/19
DSB-47 SL (15.5-16.5)**	50218263011**	Soil	02/28/19
DSB-47 SL (20.5-21.5)	50218263012	Soil	02/28/19
FD-16 SL	50218263013	Soil	02/28/19
DSB-46 SL (7.6-8.6)MS	50218263005MS	Soil	02/28/19
DSB-46 SL (7.6-8.6)MSD	50218263005MSD	Soil	02/28/19

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Design-Level Data Soil Investigation work Plan, Franklin Power Products, Inc./Amphenol Corporation, Franklin, Indiana (February 2019), the Additional Off-Site Groundwater Investigation Work Plan, Franklin Power Products, Inc./Amphenol Corporation, Franklin, Indiana (February 2019), and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260C

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
03/04/19	Vinyl chloride	26.3535	All samples in SDG 50218263	UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
DSB-46 SL (7.6-8.6)MS/MSD (DSB-46 SL (7.6-8.6))	Tetrachloroethene	-	239 (24-151)	J (all detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
DSB-46 SL (7.6-8.6)MS/MSD (DSB-46 SL (7.6-8.6))	Tetrachloroethene	22 (≤20)	J (all detects)	A

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples DSB-46 SL (21-22) and FD-16 SL were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD
	DSB-46 SL (21-22)	FD-16 SL	
Tetrachloroethene	0.15	0.093	47
1,1,1-Trichloroethane	0.037	0.021	55
Trichloroethene	1.1	1.8	48

XI. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Affected Compound	Flag	A or P
DSB-46 SL (15.5-16.5)	Fluorobenzene Chlorobenzene-d5	18978 (60446-241784) 22453 (47790-191160)	All compounds	J (all detects) UJ (all non-detects)	P

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D, MS/MSD %R and RPD, and internal standard area, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Former Amphenol Facility
Volatiles - Data Qualification Summary - SDG 50218263

Sample	Compound	Flag	A or P	Reason
DSB-45 SL (7.6-8.6) DSB-45 SL (9.3-10.3)** DSB-45 SL (12.5-13.5) DSB-45 SL (15.5-16.5) DSB-46 SL (7.6-8.6) DSB-46 SL (9.3-10.3) DSB-46 SL (15.5-16.5) DSB-46 SL (21-22) DSB-47 SL (7.65-8.65) DSB-47 SL (9.4-10.4) DSB-47 SL (15.5-16.5)** DSB-47 SL (20.5-21.5) FD-16 SL	Vinyl chloride	UJ (all non-detects)	A	Continuing calibration (%D)
DSB-46 SL (7.6-8.6)	Tetrachloroethene	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)(RPD)
DSB-46 SL (15.5-16.5)	All compounds	J (all detects) UJ (all non-detects)	P	Internal standards (area)

Former Amphenol Facility
Volatiles - Laboratory Blank Data Qualification Summary - SDG 50218263

No Sample Data Qualified in this SDG

Former Amphenol Facility
Volatiles - Field Blank Data Qualification Summary - SDG 50218263

No Sample Data Qualified in this SDG

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-45 SL (7.6-8.6) **Lab ID: 50218263001** Collected: 02/28/19 14:20 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0063	0.00039	1		03/04/19 14:28	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0063	0.00042	1		03/04/19 14:28	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0063	0.00034	1		03/04/19 14:28	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0063	0.00044	1		03/04/19 14:28	156-60-5	
Methylene Chloride	ND	mg/kg	0.025	0.0091	1		03/04/19 14:28	75-09-2	
Tetrachloroethene	**0.056**	mg/kg	0.0063	0.00039	1		03/04/19 14:28	127-18-4	
1,1,1-Trichloroethane	ND	mg/kg	0.0063	0.00043	1		03/04/19 14:28	71-55-6	
Trichloroethene	**0.0081**	mg/kg	0.0063	0.00042	1		03/04/19 14:28	79-01-6	
Vinyl chloride	ND U	mg/kg	0.0063	0.0063	1		03/04/19 14:28	75-01-4	
Surrogates									
Dibromofluoromethane (S)	99	%.	80-127		1		03/04/19 14:28	1868-53-7	
Toluene-d8 (S)	100	%.	72-136		1		03/04/19 14:28	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	57-130		1		03/04/19 14:28	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**5.4**	%	0.10	0.10	1		03/01/19 14:54		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-45 SL (9.3-10.3) **Lab ID: 50218263002** Collected: 02/28/19 14:22 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0051	0.00032	1		03/04/19 15:03	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0051	0.00034	1		03/04/19 15:03	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0051	0.00028	1		03/04/19 15:03	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0051	0.00036	1		03/04/19 15:03	156-60-5	
Methylene Chloride	ND	mg/kg	0.020	0.0073	1		03/04/19 15:03	75-09-2	
Tetrachloroethene	**0.031**	mg/kg	0.0051	0.00032	1		03/04/19 15:03	127-18-4	
1,1,1-Trichloroethane	ND	mg/kg	0.0051	0.00035	1		03/04/19 15:03	71-55-6	
Trichloroethene	**0.0030J**	mg/kg	0.0051	0.00034	1		03/04/19 15:03	79-01-6	
Vinyl chloride	ND UJ	mg/kg	0.0051	0.0051	1		03/04/19 15:03	75-01-4	
Surrogates									
Dibromofluoromethane (S)	100	%.	80-127		1		03/04/19 15:03	1868-53-7	
Toluene-d8 (S)	104	%.	72-136		1		03/04/19 15:03	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	57-130		1		03/04/19 15:03	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**5.3**	%	0.10	0.10	1		03/01/19 14:55		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-45 SL (12.5-13.5) **Lab ID: 50218263003** Collected: 02/28/19 14:25 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0063	0.00039	1		03/04/19 15:37	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0063	0.00042	1		03/04/19 15:37	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0063	0.00034	1		03/04/19 15:37	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0063	0.00044	1		03/04/19 15:37	156-60-5	
Methylene Chloride	ND	mg/kg	0.025	0.0090	1		03/04/19 15:37	75-09-2	
Tetrachloroethene	**0.080**	mg/kg	0.0063	0.00039	1		03/04/19 15:37	127-18-4	
1,1,1-Trichloroethane	ND	mg/kg	0.0063	0.00043	1		03/04/19 15:37	71-55-6	
Trichloroethene	**0.012**	mg/kg	0.0063	0.00042	1		03/04/19 15:37	79-01-6	
Vinyl chloride	ND	mg/kg	0.0063	0.0063	1		03/04/19 15:37	75-01-4	
Surrogates									
Dibromofluoromethane (S)	98	%.	80-127		1		03/04/19 15:37	1868-53-7	
Toluene-d8 (S)	106	%.	72-136		1		03/04/19 15:37	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	57-130		1		03/04/19 15:37	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**9.1**	%	0.10	0.10	1		03/01/19 14:55		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-45 SL (15.5-16.5) **Lab ID: 50218263004** Collected: 02/28/19 14:30 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0046	0.00029	1		03/04/19 16:12	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0046	0.00031	1		03/04/19 16:12	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0046	0.00025	1		03/04/19 16:12	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0046	0.00032	1		03/04/19 16:12	156-60-5	
Methylene Chloride	ND	mg/kg	0.019	0.0066	1		03/04/19 16:12	75-09-2	
Tetrachloroethene	**0.012**	mg/kg	0.0046	0.00029	1		03/04/19 16:12	127-18-4	
1,1,1-Trichloroethane	**0.0057**	mg/kg	0.0046	0.00032	1		03/04/19 16:12	71-55-6	
Trichloroethene	**0.057**	mg/kg	0.0046	0.00031	1		03/04/19 16:12	79-01-6	
Vinyl chloride	ND U J	mg/kg	0.0046	0.0046	1		03/04/19 16:12	75-01-4	
Surrogates									
Dibromofluoromethane (S)	101	%.	80-127		1		03/04/19 16:12	1868-53-7	
Toluene-d8 (S)	102	%.	72-136		1		03/04/19 16:12	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	57-130		1		03/04/19 16:12	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**8.0**	%	0.10	0.10	1		03/01/19 14:55		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-46 SL (7.6-8.6) **Lab ID: 50218263005** Collected: 02/28/19 14:40 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0067	0.00042	1		03/04/19 16:46	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0067	0.00044	1		03/04/19 16:46	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0067	0.00036	1		03/04/19 16:46	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0067	0.00047	1		03/04/19 16:46	156-60-5	
Methylene Chloride	ND	mg/kg	0.027	0.0096	1		03/04/19 16:46	75-09-2	
Tetrachloroethene	**0.057** J	mg/kg	0.0067	0.00042	1		03/04/19 16:46	127-18-4	M1,R1
1,1,1-Trichloroethane	ND	mg/kg	0.0067	0.00046	1		03/04/19 16:46	71-55-6	
Trichloroethene	**0.0055J**	mg/kg	0.0067	0.00044	1		03/04/19 16:46	79-01-6	
Vinyl chloride	ND U J	mg/kg	0.0067	0.0067	1		03/04/19 16:46	75-01-4	
Surrogates									
Dibromofluoromethane (S)	99	%.	80-127		1		03/04/19 16:46	1868-53-7	
Toluene-d8 (S)	101	%.	72-136		1		03/04/19 16:46	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	57-130		1		03/04/19 16:46	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**5.8**	%	0.10	0.10	1		03/01/19 14:55		

REPORT OF LABORATORY ANALYSIS

3/4/19

Pace Analytical Services, LLC
7726 Moller Road
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ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-46 SL (9.3-10.3) **Lab ID: 50218263006** Collected: 02/28/19 14:55 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0050	0.00031	1		03/04/19 18:29	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0050	0.00033	1		03/04/19 18:29	107-06-2	
cis-1,2-Dichloroethene	**0.020**	mg/kg	0.0050	0.00027	1		03/04/19 18:29	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0050	0.00035	1		03/04/19 18:29	156-60-5	
Methylene Chloride	ND	mg/kg	0.020	0.0072	1		03/04/19 18:29	75-09-2	
Tetrachloroethene	**0.073**	mg/kg	0.0050	0.00031	1		03/04/19 18:29	127-18-4	
1,1,1-Trichloroethane	ND	mg/kg	0.0050	0.00034	1		03/04/19 18:29	71-55-6	
Trichloroethene	**0.016**	mg/kg	0.0050	0.00033	1		03/04/19 18:29	79-01-6	
Vinyl chloride	ND L5	mg/kg	0.0050	0.0050	1		03/04/19 18:29	75-01-4	
Surrogates									
Dibromofluoromethane (S)	96	%.	80-127		1		03/04/19 18:29	1868-53-7	
Toluene-d8 (S)	107	%.	72-136		1		03/04/19 18:29	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	57-130		1		03/04/19 18:29	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**4.7**	%	0.10	0.10	1		03/01/19 14:55		

REPORT OF LABORATORY ANALYSIS

3/14/19

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-46 SL (15.5-16.5) **Lab ID: 50218263007** Collected: 02/28/19 15:25 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0054	0.00033	1		03/04/19 19:04	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0054	0.00035	1		03/04/19 19:04	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0054	0.00029	1		03/04/19 19:04	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0054	0.00038	1		03/04/19 19:04	156-60-5	
Methylene Chloride	ND	mg/kg	0.021	0.0077	1		03/04/19 19:04	75-09-2	
Tetrachloroethene	**0.12**	mg/kg	0.0054	0.00033	1		03/04/19 19:04	127-18-4	
1,1,1-Trichloroethane	ND	mg/kg	0.0054	0.00036	1		03/04/19 19:04	71-55-6	
Trichloroethene	**0.0037J**	mg/kg	0.0054	0.00035	1		03/04/19 19:04	79-01-6	
Vinyl chloride	ND	mg/kg	0.0054	0.0054	1		03/04/19 19:04	75-01-4	
Surrogates									
Dibromofluoromethane (S)	122	%.	80-127		1		03/04/19 19:04	1868-53-7	
Toluene-d8 (S)	92	%.	72-136		1		03/04/19 19:04	2037-26-5	
4-Bromofluorobenzene (S)	107	%.	57-130		1		03/04/19 19:04	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**7.3**	%	0.10	0.10	1		03/01/19 14:56		

REPORT OF LABORATORY ANALYSIS

3/14/19

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-46 SL (21-22) **Lab ID: 50218263008** Collected: 02/28/19 15:30 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0051	0.00031	1		03/04/19 19:38	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0051	0.00033	1		03/04/19 19:38	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0051	0.00027	1		03/04/19 19:38	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0051	0.00035	1		03/04/19 19:38	156-60-5	
Methylene Chloride	ND	mg/kg	0.020	0.0072	1		03/04/19 19:38	75-09-2	
Tetrachloroethene	**0.15**	mg/kg	0.0051	0.00031	1		03/04/19 19:38	127-18-4	
1,1,1-Trichloroethane	**0.037**	mg/kg	0.0051	0.00034	1		03/04/19 19:38	71-55-6	
Trichloroethene	**1.1**	mg/kg	0.23	0.015	50		03/05/19 10:32	79-01-6	
Vinyl chloride	ND	mg/kg	0.0051	0.0051	1		03/04/19 19:38	75-01-4	
Surrogates									
Dibromofluoromethane (S)	101	%.	80-127		1		03/04/19 19:38	1868-53-7	
Toluene-d8 (S)	116	%.	72-136		1		03/04/19 19:38	2037-26-5	
4-Bromofluorobenzene (S)	79	%.	57-130		1		03/04/19 19:38	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**8.7**	%	0.10	0.10	1		03/01/19 14:56		

REPORT OF LABORATORY ANALYSIS

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(317)228-3100

ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-47 SL (7.65-8.65) **Lab ID: 50218263009** Collected: 02/28/19 15:45 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0052	0.00032	1		03/04/19 20:13	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0052	0.00034	1		03/04/19 20:13	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0052	0.00028	1		03/04/19 20:13	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0052	0.00036	1		03/04/19 20:13	156-60-5	
Methylene Chloride	ND	mg/kg	0.021	0.0074	1		03/04/19 20:13	75-09-2	
Tetrachloroethene	**0.069**	mg/kg	0.0052	0.00032	1		03/04/19 20:13	127-18-4	
1,1,1-Trichloroethane	ND	mg/kg	0.0052	0.00035	1		03/04/19 20:13	71-55-6	
Trichloroethene	**0.0067**	mg/kg	0.0052	0.00034	1		03/04/19 20:13	79-01-6	
Vinyl chloride	ND UJ	mg/kg	0.0052	0.0052	1		03/04/19 20:13	75-01-4	
Surrogates									
Dibromofluoromethane (S)	101	%.	80-127		1		03/04/19 20:13	1868-53-7	
Toluene-d8 (S)	103	%.	72-136		1		03/04/19 20:13	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	57-130		1		03/04/19 20:13	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**5.2**	%	0.10	0.10	1		03/01/19 14:56		

REPORT OF LABORATORY ANALYSIS

3/14/19 K

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-47 SL (9.4-10.4) **Lab ID: 50218263010** Collected: 02/28/19 15:47 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0075	0.00046	1		03/04/19 20:47	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0075	0.00049	1		03/04/19 20:47	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0075	0.00040	1		03/04/19 20:47	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0075	0.00052	1		03/04/19 20:47	156-60-5	
Methylene Chloride	ND	mg/kg	0.030	0.011	1		03/04/19 20:47	75-09-2	
Tetrachloroethene	**0.17**	mg/kg	0.0075	0.00046	1		03/04/19 20:47	127-18-4	
1,1,1-Trichloroethane	ND	mg/kg	0.0075	0.00051	1		03/04/19 20:47	71-55-6	
Trichloroethene	**0.012**	mg/kg	0.0075	0.00049	1		03/04/19 20:47	79-01-6	
Vinyl chloride	ND	mg/kg	0.0075	0.0075	1		03/04/19 20:47	75-01-4	
Surrogates									
Dibromofluoromethane (S)	98	%.	80-127		1		03/04/19 20:47	1868-53-7	
Toluene-d8 (S)	103	%.	72-136		1		03/04/19 20:47	2037-26-5	
4-Bromofluorobenzene (S)	93	%.	57-130		1		03/04/19 20:47	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**5.8**	%	0.10	0.10	1		03/01/19 14:56		

REPORT OF LABORATORY ANALYSIS

3/10/19

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-47 SL (15.5-16.5) **Lab ID: 50218263011** Collected: 02/28/19 15:55 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0056	0.00035	1		03/04/19 21:21	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0056	0.00037	1		03/04/19 21:21	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0056	0.00030	1		03/04/19 21:21	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0056	0.00039	1		03/04/19 21:21	156-60-5	
Methylene Chloride	ND	mg/kg	0.022	0.0080	1		03/04/19 21:21	75-09-2	
Tetrachloroethene	**0.24**	mg/kg	0.0056	0.00035	1		03/04/19 21:21	127-18-4	
1,1,1-Trichloroethane	**0.0019J**	mg/kg	0.0056	0.00038	1		03/04/19 21:21	71-55-6	
Trichloroethene	**0.027**	mg/kg	0.0056	0.00037	1		03/04/19 21:21	79-01-6	
Vinyl chloride	ND UJ	mg/kg	0.0056	0.0056	1		03/04/19 21:21	75-01-4	
Surrogates									
Dibromofluoromethane (S)	97	%.	80-127		1		03/04/19 21:21	1868-53-7	
Toluene-d8 (S)	108	%.	72-136		1		03/04/19 21:21	2037-26-5	
4-Bromofluorobenzene (S)	89	%.	57-130		1		03/04/19 21:21	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**15.0**	%	0.10	0.10	1		03/01/19 14:56		

REPORT OF LABORATORY ANALYSIS

3/14/19

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: DSB-47 SL (20.5-21.5) **Lab ID: 50218263012** Collected: 02/28/19 16:00 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0060	0.00037	1		03/04/19 21:56	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0060	0.00039	1		03/04/19 21:56	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0060	0.00032	1		03/04/19 21:56	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0060	0.00042	1		03/04/19 21:56	156-60-5	
Methylene Chloride	ND	mg/kg	0.024	0.0085	1		03/04/19 21:56	75-09-2	
Tetrachloroethene	**0.10**	mg/kg	0.0060	0.00037	1		03/04/19 21:56	127-18-4	
1,1,1-Trichloroethane	**0.018**	mg/kg	0.0060	0.00041	1		03/04/19 21:56	71-55-6	
Trichloroethene	**0.23**	mg/kg	0.0060	0.00039	1		03/04/19 21:56	79-01-6	
Vinyl chloride	ND UJ	mg/kg	0.0060	0.0060	1		03/04/19 21:56	75-01-4	
Surrogates									
Dibromofluoromethane (S)	102	%.	80-127		1		03/04/19 21:56	1868-53-7	
Toluene-d8 (S)	113	%.	72-136		1		03/04/19 21:56	2037-26-5	
4-Bromofluorobenzene (S)	84	%.	57-130		1		03/04/19 21:56	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**8.5**	%	0.10	0.10	1		03/01/19 14:56		

REPORT OF LABORATORY ANALYSIS

3/14/19

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: Amphenol
Pace Project No.: 50218263

Sample: FD-16 SL **Lab ID: 50218263013** Collected: 02/28/19 08:00 Received: 03/01/19 12:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
1,1-Dichloroethane	ND	mg/kg	0.0043	0.00027	1		03/04/19 22:30	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.0043	0.00028	1		03/04/19 22:30	107-06-2	
cis-1,2-Dichloroethene	ND	mg/kg	0.0043	0.00023	1		03/04/19 22:30	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.0043	0.00030	1		03/04/19 22:30	156-60-5	
Methylene Chloride	ND	mg/kg	0.017	0.0061	1		03/04/19 22:30	75-09-2	
Tetrachloroethene	**0.093**	mg/kg	0.0043	0.00027	1		03/04/19 22:30	127-18-4	
1,1,1-Trichloroethane	**0.021**	mg/kg	0.0043	0.00029	1		03/04/19 22:30	71-55-6	
Trichloroethene	**1.8**	mg/kg	0.24	0.016	50		03/05/19 11:07	79-01-6	
Vinyl chloride	ND UJ	mg/kg	0.0043	0.0043	1		03/04/19 22:30	75-01-4	
Surrogates									
Dibromofluoromethane (S)	100	%.	80-127		1		03/04/19 22:30	1868-53-7	
Toluene-d8 (S)	114	%.	72-136		1		03/04/19 22:30	2037-26-5	
4-Bromofluorobenzene (S)	86	%.	57-130		1		03/04/19 22:30	460-00-4	
Percent Moisture	Analytical Method: SM 2540G								
Percent Moisture	**9.2**	%	0.10	0.10	1		03/01/19 14:56		

REPORT OF LABORATORY ANALYSIS

3/14/19

LDC #: 44535A1a **VALIDATION COMPLETENESS WORKSHEET** Date: 03/14/19
SDG #: 50218263 Level III/IV Page: 1 of 2
Laboratory: Pace Analytical Energy Services, LLC Reviewer: JVC
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	ICAL ≤ 20% ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	D = 8/13
XI.	Internal standards	SW	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Target compound identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	DSB-45 SL (7.6-8.6)	50218263001	Soil	02/28/19
2	DSB-45 SL (9.3-10.3)**	50218263002**	Soil	02/28/19
3	DSB-45 SL (12.5-13.5)	50218263003	Soil	02/28/19
4	DSB-45 SL (15.5-16.5)	50218263004	Soil	02/28/19
5	DSB-46 SL (7.6-8.6)	50218263005	Soil	02/28/19
6	DSB-46 SL (9.3-10.3)	50218263006	Soil	02/28/19
7	DSB-46 SL (15.5-16.5)	50218263007	Soil	02/28/19
8	DSB-46 SL (21-22)	50218263008	Soil	02/28/19
9	DSB-47 SL (7.65-8.65)	50218263009	Soil	02/28/19
10	DSB-47 SL (9.4-10.4)	50218263010	Soil	02/28/19
11	DSB-47 SL (15.5-16.5)**	50218263011**	Soil	02/28/19
12	DSB-47 SL (20.5-21.5)	50218263012	Soil	02/28/19
13	FD-16 SL	50218263013	Soil	02/28/19

LDC #: 44535A1a **VALIDATION COMPLETENESS WORKSHEET** Date: 03/14/19
SDG #: 50218263 Level III/IV Page: 2 of 2
Laboratory: Pace Analytical Energy Services, LLC Reviewer: CM
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260)

	Client ID	Lab ID	Matrix	Date
14	DSB-46 SL (7.6-8.6)MS	50218263005MS	Soil	02/28/19
15	DSB-46 SL (7.6-8.6)MSD	50218263005MSD	Soil	02/28/19
16				
17				
18				
19				
20				

Notes:

-	MB 2248089						

LDC #: 45535A1C

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JVG
2nd Reviewer:

Method: Volatiles (EPA SW 846 Method 8260C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		

LDC #: 44595A1a

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: [signature]

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓	✓		
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene	A2.
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane	B2.
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane	C2.
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene	D2.
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11	E2.
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12	F2.
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113	G2.
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114	H2.
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane	I2.
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide	J2.
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane	K2.
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane	L2.
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane	M2.
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane	N2.
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane	O2.
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane	P2.
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane	Q2.
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane	R2.
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane	S2.
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane	T2.
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal	U2.
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene	V2.
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol	W2.
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene	X2.
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.	Y2.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.	Z2.

LDC #: 44535 A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y (N) N/A Were percent differences (%D) ≤20 % and relative response factors (RRF) within the method criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%)	Finding RRF (Limit)	Associated Samples	Qualifications
	03/04/19	14620375CCV	C	26.3535		All (ND)	J/UJ/A

Note: * = Ave RRF failed method criteria but within validation criteria

LDC #: 44535A1a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD : GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		14/15	AA	( )	239 (24-151)	( )	5 (Det)	J dets/A
			AA	( )	( )	22 (20)	↓ ↓	↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 44535A1a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds identified in the field duplicate pairs?

Compound	Concentration (mg/Kg)		RPD
	8	13	
AA	0.15	0.093	47
N	0.037	0.021	55
S	1.1	1.8	48

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LDC #: 49535 A1a

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all internal standard area counts within -50 to +100% of the associated calibration standard?

(Y) N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
16% 23%		7 (MD + Rec)	FBZ	18978 (60446 - 241784)		J/UJ/P (qual all)
			CBZ	22453 (97790 - 191160)		

(BCM) = Bromochloromethane
(DFB) = 1,4-Difluorobenzene
(CBZ) = Chlorobenzene-d5
(PFB) = Pentafluorobenzene
(4DCB) = 1,4-Dichlorobenzene-d4
(2DCB) = 1,2-Dichlorobenzene-d4
(FBZ) = Fluorobenzene

LDC #: 44535A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 50 std)	Recalculated RRF (RRF 50 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL 50MV5B	2/26/2019	Trichloroethene (DFB)	0.31371	0.31371	0.29514	0.29514	7.4734	7.4734
			Tetrachloroethane (CBZ)	0.49697	0.49697	0.46929	0.46930	7.6615	7.6615

LDC # 44535A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CCV)	Recalculated RRF (CCV)	Reported % D	Recalculated %D
1	14620375CCV	3/4/2019	Trichloroethene (FBZ)	0.29514	0.31457	0.31457	6.58	6.58
			Tetrachloroethane (CBZ)	0.46929	0.50302	0.50302	7.19	7.19

LDC #: 44535 A1a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer: [signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	50.0	50.0636	100	100	0
1,2-Dichloroethane-d4					
Toluene-d8		51.8783	104	104	
Bromofluorobenzene		49.2417	98	98	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 44535A1a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = | MSC - MSC | * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD sample: 14/15

Compound	Spike Added (mg/kg)		Sample Concentration (mg/kg)	Spiked Sample Concentration (mg/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	----	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene[a]	0.0625	0.0515	0	0.0504	0.0501	81	81	97	97	0	0
Trichloroethene	↓	↓	0.0055	0.0528	0.0585	76	76	99	99	7	7
Benzene											
Toluene											
Chlorobenzene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 94535A1a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: LCS 2248090

Compound	Spike Added (mg/kg)		Spiked Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene[a]	0.050	NA	0.054	NA	107	107				
Trichloroethene	↓	↓	0.047	↓	93	93				
Benzene										
Toluene										
Chlorobenzene										

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 49505 A1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 11 , AA :

Conc. = $\frac{(162195)(50.0)(5\,ml)}{(79758)(6.46929)(5.271g)(0.58973)(1000)}$

= 0.242 mg/kg

#	Sample ID	Compound	Reported Concentration (mg/kg)	Calculated Concentration ( )	Qualification
			0.24		